

NATURAL RESOURCES CONSERVATION SERVICE
PACIFIC BASIN AREA
CONSERVATION PRACTICE STANDARD

ROCK BARRIER

(Meters, Feet)
CODE 555

DEFINITION

A rock retaining wall constructed across the slope to form and support a bench terrace that will control the flow of water and check erosion on sloping land.

PURPOSE

To stabilize steeply sloping land so that it can be farmed with a minimum of soil loss.

CONDITIONS WHERE PRACTICE APPLIES

Rock barriers are applicable to land suitable for cultivation where soil depth is adequate for benching and where the effectiveness of less intensive measures for soil and water conservation would be questionable. Suitable natural outlets or satisfactory sites for constructing outlets must be available.

CRITERIA

Slope. The top of the rock barrier may be level or have a grade toward the outlet. The maximum slope shall be 0.5 percent.

Cross Slope. The bench between barriers shall have a negative slope from the top of one barrier to the toe of the upslope barrier. Cross slopes shall have a grade of 1.0 to 3.0 percent.

Drainage. All benches shall be free draining, either to a surface outlet or an Underground Outlet (620). For surface drainage the bench shall have a longitudinal ditch along the toe of the upslope barrier. Surface and underground outlet sizing shall be based on Chapter 2 of the Engineering Field Handbook hydrology and appropriate hydraulics (Chapters 3, 7, or 9 of the Engineering Field Handbook).

Height. The height of the barrier shall not exceed 1.8 meters (6 ft).

Base Width. The minimum base width shall be 0.5 meter (1.5 ft) plus 12 cm (5 inches) for

each 15 cm (0.5 ft) of height in excess of 0.75 meters (2.5 ft). The exposed face of the barrier shall have a batter of 1:4 (one horizontal to four vertical).

Vertical Interval. Vertical Interval between adjacent benches shall not exceed 1.5 meters (5 ft).

Horizontal Interval. The minimum horizontal distance between barriers shall be 3 meters (10 ft).

CONSIDERATIONS

Horizontal interval should be based on required traffic or cropping width to maintain farm-ability of the final topography. Sufficient rock from the field or the immediate area should be available to construct the barriers. If only large rocks are to be used for the barriers it may be necessary to use a filtering medium (broadly graded gravel, geo-textile, or long lived fiber material) to prevent soil from piping through the barrier to the bench below. Access to each bench should be maintained at both ends so that crops can be planted and harvested with the commonly used equipment. If a grassed waterway or other outlet needs to be constructed to receive the water from the channels at the toes of the benches, they shall be constructed prior to the installation of the benches. Grassed waterway outlets shall have established vegetation prior to rock barrier construction.

PLANS AND SPECIFICATIONS

Plans and specifications for constructing the rock barriers shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve the intended purpose. Drawings shall meet Chapter four of the Engineering Field Handbook guidelines. Drawings shall specifically include a plan view to scale

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showing field boundaries, magnetic north, orientation and spacing of rock barriers. Where multiple rock barriers will exist in a system, the horizontal spacing of the barriers shall be shown. If underground outlets are part of a system, then the location of the conduit shall be shown. For systems greater than 1 hectare in size (2.47 acres), a cross section of the field with height of rock barriers, vertical spacing, and base width shall be included. Where significant water management is required, profiles and cross sections of the water management features will be included in the construction drawings. Information communicating the following shall be included on the construction drawings:

Construction shall begin with the top barrier.

A vertical cut equal to one half the height of the barrier shall be made along the stake line (the uphill edge of the base).

Operations shall be such that topsoil reutilization is optimized.

The foundation for the barrier shall be shaped so that the full base width is smooth and uniform.

As the barrier is built, the area behind it shall be kept filled with soil.

The area above the barrier shall be smoothed to design cross slope and the drainage ditch shall be constructed according to plan.

Construction operations shall be carried out in such a manner that erosion and air and water pollution are minimized and kept within legal limits.

OPERATION AND MAINTENANCE

Maintenance of the system requires removal of woody vegetation from the rock barrier before it becomes established, maintaining the capacity of the surface water management components of the system to include keeping the trash racks at inlets to underground outlets free of debris, removal of silt accumulations from channels, and mowing of areas not in the crops (ditches, around fruit trees, associated grassed waterways, etc.). Rocks that work loose from the barriers need to be incorporated back into the system.